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ANTHURIDS FROM THE WEST COAST OF NORTH AMERICA, INCLUDING A NEW SPECIES AND THREE NEW GENERA (CRUSTACEA, ISOPODA)

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Abstract.—Schultz, George A., 15 Smith St., Hampton, New Jersey 08827. —A review is given of the seven named and two unnamed species of anthurid isopods recorded from the west coast of North America. Two new genera, *Califanthura* and *Silophasma* are proposed respectively for *Colanthura squamosissima* Menzies, 1951, and *Haliophasma geminata* Menzies and Barnard, 1959. A new genus and species, *Cortezura penascoensis*, from the Gulf of California, is described.

The anthurids of the west coast of North America include 7 named species, each in a separate genus. The citation by Brusca (1973) of *Mesanthura* sp. adds another if that species proves not to be *M. occidentalis* Menzies and Barnard (1959). Also Menzies (1962) added an "Anthurid" which was not more exactly named. With the new species described herein 8 named species of anthurids and 2 anthurids of uncertain status are recorded from the west coast of North America. One of the established genera is abolished and one is redefined so as to exclude the species from the west coast, so 2 new genera are proposed for established species. One new genus is described here for a new species so that the total number of named genera of anthurids from the west coast of North America, 8, also equals the number of species present. A key to the 8 named species follows the discussions of the individual species.

Califanthura, new genus

Colanthura Richardson, 1902.—Menzies, 1951:15.—Menzies and Barnard, 1959:15.

nec Colanthura Richardson, 1902.—Schultz, 1969:89.

The genus *Colanthura* Richardson (1902) is based on *C. tenuis* Richardson (1902) (type-species by monotypy) from Bermuda. *Colanthura tenuis*, as described by Richardson, is based on 2 tiny specimens each with 6 large peraeonal segments and a pleon composed of very short segments. The specimens are identical with tiny specimens of *Paranthura infundibulata* Richardson (1902), which also have a short pleon composed of very short segments (personal observation and comparison of type-specimen and other specimens in Peabody Museum, Yale University). Since the type-

species of the genus is not a valid species, the genus is invalid and the generic name must be supressed.

Menzies (1951) placed the species *squamosissima* in *Colanthura* Richardson so that it must now be placed in another genus or a new genus must be created to include it. Menzies (1951, p. 15) used the generic name without discussion. Menzies and Barnard (1959) gave a diagnosis of the genus based mostly on *C. squamosissima*. The diagnosis of the new genus *Califanthura* follows that of Menzies and Barnard (1959, p. 15) with some modifications.

Diagnosis.—Eyes small. Mouthparts for piercing and sucking. Peraeonal segment VII vestigal. Pleon short with distinct sutures. Telson flattened, not indurate, without paired statocysts. Maxillipedal palp triarticulate. Palm of peraeopod I smooth, with prominent basal tooth. Peraeopods IV–VI with carpus not underwriting propodus. Pleopods 1 not indurate.

Etymology and gender.—The generic name *Califanthura* is formed from a combination of *Cali*fornia and the suffix "-anthura." The gender is feminine.

Type-species.—*Colanthura squamosissima* Menzies, 1951.

Califanthura squamosissima (Menzies)

Colanthura squamosissima Menzies, 1951:115, figs. 14–16.—Menzies and Barnard, 1959:15, fig. 9A, B.—Schultz, 1969:90, 117.

The species is distinguished from other anthurids on the west coast because it lacks a well developed peraeonal segment VII. What appears to be a vestige of that segment appears in the illustration of Menzies (1951, p. 115, fig. 14a) just in front of the pleon. Menzies recorded a gravid female 5.2 mm long. The species is well described and illustrated by Menzies (1951) and also diagnosed by Menzies and Barnard (1959). It is found from Marin County, California, south to the Mexican border in depths from 18.3–90.1 m.

Silophasma, new genus

Haliophasma Haswell.—Menzies and Barnard, 1959, p. 17.

The genus *Haliophasma* Haswell, 1881, was described from species from Australia, and *H. purpureum* is the type-species (Poore, 1975 p. 503—type by virtual monotypy). Poore restricted the genus to species with particular morphological characters, redescribing the Australian species. Here the species *H. geminatum* Menzies is placed in a new genus *Silophasma* since it does not conform to Poore's new restricted definition of *Haliophasma* Haswell. Poore excludes *H. geminatum* from the genus because it lacks dorsal grooves and pits.

The diagnosis of *Haliophasma* by Menzies and Barnard (1959) was based mainly on *H. geminatum*. They stated originally that it had "piercing

and sucking" mouthparts, but afterwards Menzies (1962) corrected this to chewing mouthparts. In the later work Menzies recorded immature specimens of what he tentatively identified as the species. The species is here placed in the new genus *Silophasma* which is diagnosed as follows:

Diagnosis.—Eyes present. Mouthparts for chewing. Statocysts paired. Telson sculptured. No dorsal grooves or pits. Carpus of peraeopods IV–VII not underriding propodus. Pleopods 1 operculate. Maxillipedal palp of 4 articles. Peraeonal segment VII shortest of all. Pleon longer than peraeonal segment VII with sutures indistinct. Male with extremely long antenna 2.

Etymology and gender.—"Silo-" is without meaning and "-phasma," the suffix of the former generic name *Haliophasma*, means ghost in Latin. The gender is neuter.

Type-species.—*Haliophasma geminatum* Menzies and Barnard, 1959. Poore (1975) stated that *Haliophasma* Haswell is neuter, so Menzies and Barnard should have used *geminatum*, not *geminata*, as their name for the species.

Silophasma geminatum (Menzies and Barnard)

Haliophasma geminata Menzies and Barnard, 1959:17, figs. 11–12.—Menzies, 1962:339.—Schultz, 1964:312; 1966:13; 1969:103, fig. 141.—Iverson, 1974: 165.

Haliophasma geminatum Menzies and Barnard.—Poore, 1975:531.

The species has been recorded from Monterey Bay to Bahía de San Quintin, Baja California, in stations in depths of 9.2–512.4 m. The range also includes stations near Santa Catalina Island. It ranges to 7 mm long, and is apparently quite common on the continental shelf.

Cyanthura munda Menzies

Cyanthura munda Menzies, 1951:111, figs. 112, 13.—Menzies and Barnard, 1959:16, fig. 10A, B.—Schultz, 1964:312; 1969:105, fig. 144a–c.

A female 6 mm long was the largest recorded by Menzies (1951). It has been recorded from Marin County, California, to the Mexican border in depths of from 18.3–55 m.

Paranthura elegans Menzies

Paranthura elegans Menzies, 1951:106, figs. 9–11; 1962:340.—Menzies and Barnard, 1959:19, fig. 13.—Schultz, 1969:94, fig. 125a–c.

The species, which ranges to 9.1 mm long, has been collected from Marin County, California, to Bahía de San Quintin, Baja California, from shallow water to a depth of 55 m.

Bathura luna Schultz

Bathura luna Schultz, 1966:12, pl. 7; 1969:98, fig. 132.

The genus contains a single blind species which ranges to 21 mm long. It was taken from Tanner Canyon on the continental shelf off Los Angeles at depths between 783 and 812 m. It has not been reencountered since its initial description.

Apanthura californiensis Schultz

Apanthura californiensis Schultz, 1964:312, fig. 4; 1969:99, fig. 135.

The species which ranges to 11 mm long was taken off Santa Monica, California, at a depth of 80 m. It has not been reencountered.

Mesanthura occidentalis Menzies and Barnard

Mesanthura occidentalis Menzies and Barnard, 1959:15, fig. 9A, B.—Schultz, 1969:109, fig. 152a–d.
? *Mesanthura* sp. of Brusca, 1973:202, fig. 7.17.

The species (holotype ♀ = 7 mm long) was collected from shallow water to water 55 m deep from Point Conception, California, to Bahía de San Quintin, Baja California. Brusca (1973) took specimens which he called "*Mesanthura* sp." from algal mats in the intertidal zone of Puerto Peñasco, at the northern part of the Gulf of California. Only limited morphological data were given, but some comparison of it was made with *M. occidentalis*. No formal name was given to the specimens however.

Anthurid of Menzies

Anthurid n. gen. & n. sp. Menzies, 1962:339.

The 3 specimens on which this name is based were never formally described by Menzies (1962). They have chewing mouthparts and are in the family Anthuridae near *Kupellonura* Barnard (1925) according to Menzies. The specimens were briefly described without any definite distinguishing characters by Menzies.

Cortezura, new genus

Diagnosis.—Blind. Mouthparts modified for chewing. Frontal margin of cephalon with medial process as long as anterolateral corners. Peraeonal segment VII shortest of 7 peraeonal segments. Pleon with 6 conspicuous segments. Telson, not indurate, with uropods fan-shaped. Dorsum smooth, medial ventral ridge on all peraeonal segments. Antennae 1 and 2 short with

few flagellar articles in both males and females. Maxillipedal palp of 3 articles. Peraeopod I subchelate. Carpus underrides propodus only slightly on anterior peraeopods, never on posterior peraeopods. Pleopods 1 operculate. No statocysts.

Etymology and gender.—The generic name is derived from the alternate name of the Gulf of California, "The Sea of Cortez." The suffix "-ura" is without meaning. The gender is feminine.

Type-species.—*Cortezura penascoensis,* sp. nov.

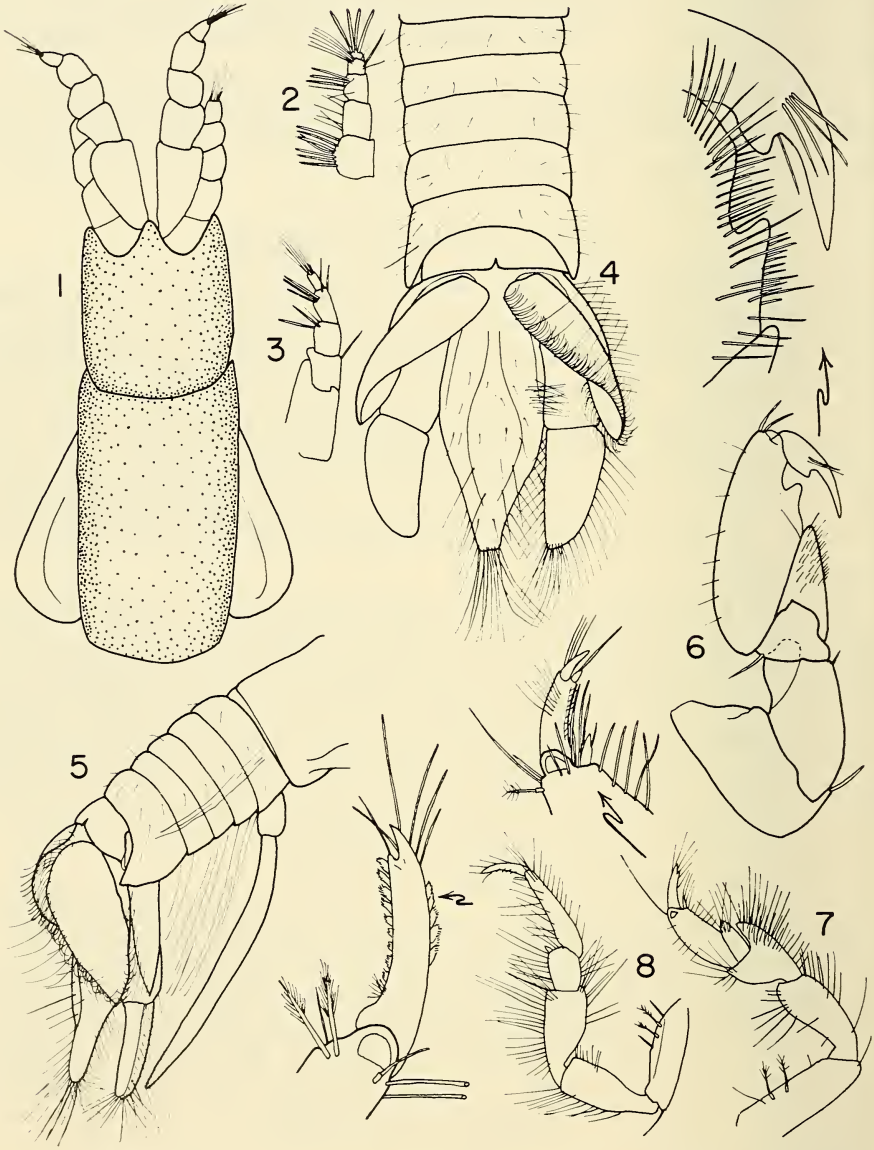
Cortezura penascoensis, new species

Description.—Blind. Cephalon slightly narrower and just over ⅔ length of peraeonal segment I; frontal margin with medial process as long as anterolateral corners. Peraeonal segments I–VI about equal in length; peraeonal segment VII shortest, about ⅔ length of peraeonal segment VI. Pleon with 6 conspicuous segments; telson slightly longer than 6 pleonal segments combined, with abruptly narrowing lateral borders ending in narrow truncate border. Dorsum smooth; no dorsal ornamentations, pits or lateral folds on any peraeonal segment or cephalon. Strong medial ridge ventrally; top of ridge flattened, with shallow medial groove along complete length.

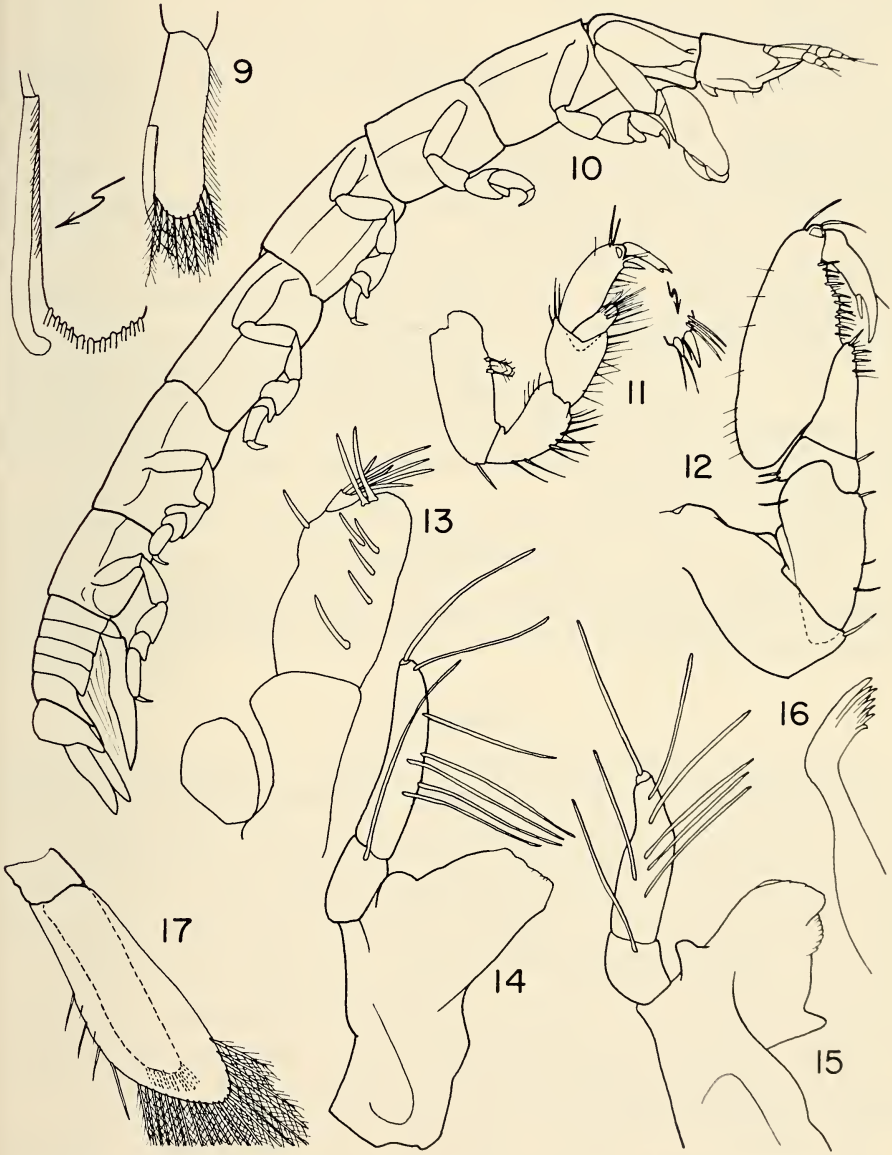
Antennae 1 and 2 short, similar in males and females. Antenna 1 with apparently only 2 flagellar articles; antenna 2 longer than antenna 1 with apparently only 1 flagellar article. Maxillipedal palp with 3 articles (4 if after Barnard, 1925:112); long setae on tiny apical article; at least 8 long setae on outer side of subapical segment; no endite apparent; exopod small, ovate, set into basal segment. Mandibles with tiny crenulations on incisor border; palp of 3 articles, apical article minute with one long seta; 6 long setae on article 2; 1 seta on basal article. Exopod of maxilla 1 with apex curved medially with many small teeth.

Peraeopod I subchelate with large apical and smaller subapical claws. Large ovate propodus with inner margin slightly curved in female; with conspicuous notch and process on male. Dactylus in male also with process on inner margin. Few setae on inner margin of segments of peraeopod I of male and female; many setae on inner margins of segments of peraeopod II of male and female. Peraeopods II and III with carpus somewhat underriding propodus. Carpus of each peraeopod from IV–VII slightly longer with carpus of VII longest. On peraeopods IV–VII carpus not underriding propodus.

Pleopods 1 operculate; endopods only slightly narrower proximally than exopods. Long plumose fringing setae on apex of each ramus. Endopod of male pleopod 2 with laterally curved endopod (male stylet) on inner margin ending in rounded apex. Many long fringing setae on margins of other pleopods. Uropods with many long stiff fringing setae; apex of



Figs. 1–8. *Cortezura penascoensis*, holotype male. 1, Anterior part; 2, Antenna 1; 3, Antenna 2; 4, Pleon and telson (dorsal view); 5, Pleon and telson (lateral view); 6, Peraeopod I with detail of palm; 7, Peraeopod II; 8, Peraeopod VII.



Figs. 9–16. *Cortezura penascoensis*. 9, Pleopod 2 male; 10, Lateral view of female; 11, Peraeopod II female; 12, Peraeopod I female; 13, Maxillipedal palp; 14, 15, Mandibles; 16, Maxilla I.

exopod ovate; endopod longer than basis extending to about posterior margin of telson. No statocysts.

Length to 10.5 mm.

Peraeon VII is smaller and with undeveloped peraeopods in juveniles. Otherwise they are like adults. The smallest specimen (sex undetermined) with 7 mature peraeopods was 4.1 mm long.

Type-locality and ecology.—The specimens were taken from a beach at Puertecitos, near Puerto Peñasco, Sonora, Mexico, with amphipods on 13 April 1973. Males (3), females (15), unsexed (19) and juveniles (7) were collected (total 44). No females were gravid.

Etymology.—The name *penascoensis* means "from Peñasco," the large town near which the specimens were caught.

Remarks.—The species can be distinguished from all other anthurids from the west coast of North America except *Bathura luna* Schultz by the lack of eyes. It can be distinguished from *B. luna* in that *B. luna* has many flagellar articles on both antennae in contrast to the few on the flagella of the new species.

Disposition of specimens.—The type-specimens have been deposited in the National Museum of Natural History (Smithsonian Institution) (holotype ♂ USNM 170410; allotype ♀ USNM 170411; 25 paratypes ♂ USNM 170412, ♀♀ and juveniles USNM 170413). Other paratypes have been retained by the author.

Discussion

Bathura luna Schultz (1969) has been collected in deep water (783–812 m) and *Silophasma geminatum* (Menzies and Barnard, 1959) has been collected from shallow water to water 465 m deep. All other species including the new one described here are from less than 91 m, most of them being collected from intertidal to relatively shallow water. The 8 species from the west coast are in 2 families. *Silophasma geminatum* (Menzies and Barnard) and *Paranthura elegans* Menzies are both in Paranthuridae of Menzies and Glynn (1968) (apex of maxillipedal palps pointed; modified for sucking). All others are in Anthuridae (apex of maxillipedal palps rounded; modified for chewing). Apparently the species with pointed maxillipedal palps are associated with plants (algae) and are adapted to feed on them. The rounded mouthparts are of more conventional detritus feeders.

The species of the suborder Anthuridea were last classified by Barnard (1925). Many species from many localities in the world have been added since then and the group is badly in need of revision. When the revision is made, many of the genera included by Barnard will be restricted in definition and many new genera will be described. The revisions will undoubtedly include more name changes among the species from the west coast of North America.

Key to the Named Anthurids from the West Coast of North America

1a.	With 6 large peraeonal segments	*Califanthura squamosissima*
1b.	With 7 large peraeonal segments	2
2a.	Blind	3
2b.	With ocelli or eyes	4
3a.	With many flagellar articles on antennae	*Bathura luna*
3b.	With 2 or less flagellar articles on antennae	*Cortezura penascoensis*
4a.	Pleon with conspicuous pleonal segments	5
4b.	Pleon entire	6
5a.	Apex of maxillipedal palp pointed	*Paranthura elegans*
5b.	Apex of maxillipedal palp rounded	*Apanthura californiensis*
6a.	Apex of maxillipedal palp pointed	*Silophasma geminatum*
6b.	Apex of maxillipedal palp rounded	7
7a.	Apex of maxillipedal palp with small rounded segment	*Cyathura munda*
7b.	Apex of maxillipedal palp pointed (but not modified for sucking) and produced medially	*Mesanthura occidentalis*

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Literature Cited

Barnard, K. H. 1925. A revision of the family Anthuridae (Crustacea Isopoda). Jour. Linnean Soc. (Zool.) 36:109–160.

Brusca, R. C. 1973. A handbook to the common intertidal invertebrates of the Gulf of California. Univ. Arizona Press, Tucson, Arizona, 427 pp.

Iverson, E. W. 1974. Range extensions for some California marine isopod crustaceans. Bull. S. California Acad. Sci. 73(1):164–169.

Menzies, R. J. 1951. New marine isopods, chiefly from northern California, with notes on related forms. Proc. U.S. Nat. Mus. 101(3273):105–156.

———. 1962. The marine isopod fauna of Bahia de San Quintin, Baja California, Mexico. Pacific Nat. 3(11):337–348.

———, and J. L. Barnard. 1959. Marine Isopoda on coastal shelf bottoms of southern California: Systematics and Ecology. Pacific Nat. 1(11):1–43.

———, and P. W. Glynn. 1968. The common marine isopod Crustacea of Puerto Rico: A handbook for marine biologists. Stud. Fauna Curaçao and Other Caribbean Isl. 27:1–133.

Poore, G. C. B. 1975. Australian species of *Haliophasma* (Crustacea: Isopoda: Anthuridae). Rec. Australian Mus. 29(19):503–533.

Richardson, H. 1902. The marine and terrestrial isopods of the Bermudas, with descriptions of new genera and species. Trans. Connecticut Acad. Sci. 11: 277–310.

Schultz, G. A. 1964. Some marine isopod crustaceans from off the southern California coast. Pacific Sci. 18(3):307–314.

———. 1966. Marine isopods of the submarine canyons of the southern Californian continental shelf. Allan Hancock Pacific Exped. 27(4):1–56.

———. 1969. How to know the marine isopod crustaceans. Pictured Key Nature Series. Wm. C. Brown Co. Pub., Dubuque, Iowa, viii + 359 pp.